US009311621B2

(12) **United States Patent**
Coppinger et al.

(10) **Patent No.: US 9,311,621 B2**
(45) **Date of Patent: *Apr. 12, 2016**

(54) **ANNOTATING COLLABORATIVE INFORMATION STRUCTURES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 672 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/603,360**

(22) Filed: **Sep. 4, 2012**

(65) **Prior Publication Data**

US 2012/0330886 A1 Dec. 27, 2012

Related U.S. Application Data

(62) Division of application No. 11/966,131, filed on Dec. 28, 2007, now Pat. No. 8,291,308.

(51) **Int. Cl.**

G06F 17/22	(2006.01)
G06Q 10/10	(2012.01)
G06F 17/24	(2006.01)

(52) **U.S. Cl.**

CPC ***G06Q 10/10*** (2013.01); ***G06F 17/241*** (2013.01); ***G06Q 10/101*** (2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

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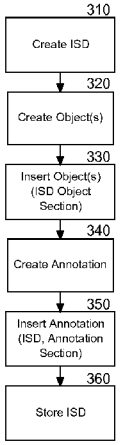
(57) **ABSTRACT**

Embodiments of the present invention address deficiencies of the art in respect to collaborative information object management and provide a method, system and computer program product for annotating collaborative information structures. In an embodiment of the invention, a method for annotating collaborative information structures can be provided. The method can include creating a collaborative information structure document (ISD) with each of an object section and an annotation section, adding a collaborative object in a collaborative computing environment to the object section of the collaborative ISD, adding an annotation for the collaborative ISD to the annotation section of the collaborative ISD, and storing the collaborative ISD for use as a collaborative object in the collaborative computing environment.

3 Claims, 1 Drawing Sheet



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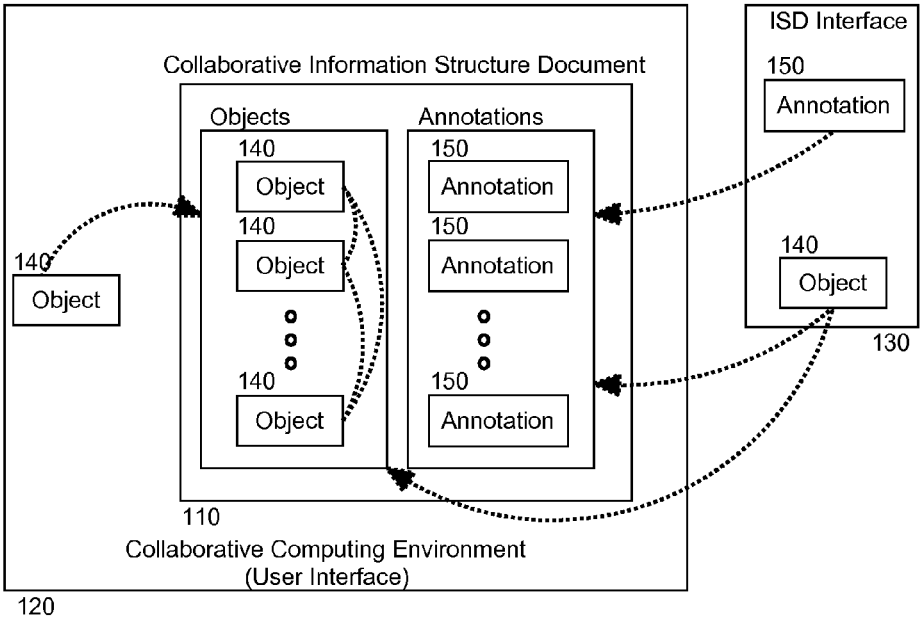

FIG. 1

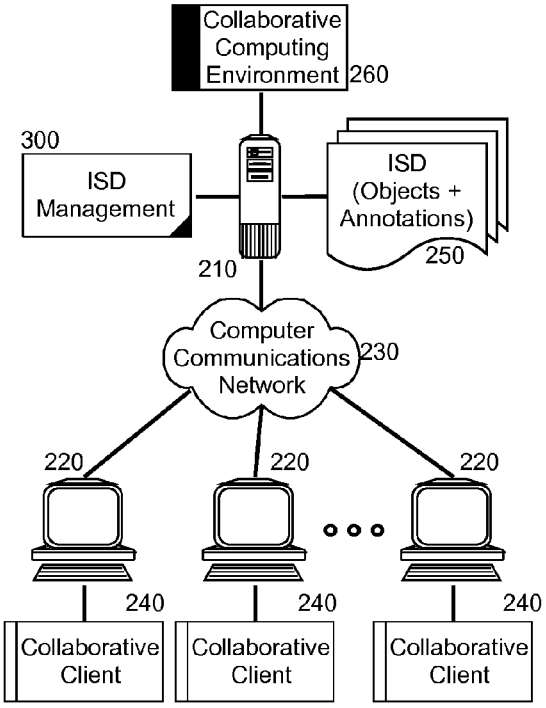

FIG. 2

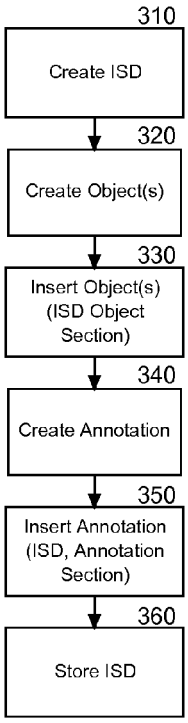

FIG. 3

ANNOTATING COLLABORATIVE INFORMATION STRUCTURES

This application is a Divisional of U.S. application Ser. No. 11/966,131, filed Dec. 28, 2007, now U.S. Pat. No. 8,291,308, entitled "ANNOTATING COLLABORATIVE INFORMATION STRUCTURES," the entirety of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the field of collaborative computing and more particularly to the grouping of collaborative objects within a collaborative information structure.

2. Description of the Related Art

Collaborative computing refers to the use by two or more end users of a computing application in order to achieve a common goal. Initially envisioned as a document sharing technology among members of a small workgroup in the corporate environment, collaborative computing has grown today to include a wide variety of technologies arranged strategically to facilitate collaboration among members of a workgroup. No longer merely restricted to document sharing, the modern collaborative environment can include document libraries, chat rooms, video conferencing, application sharing, and discussion forums to name only a few.

A collaborative computing application enjoys substantial advantages over a more conventional, individualized computing application. Specifically, at present it is rare that a goal of any importance is entrusted and reliant upon a single person. In fact, most goals and objectives can be achieved only through the participation of a multiplicity of individuals, each serving a specified role or roles in the process. Consequently, to provide computing tools designed for use only by one of the individuals in the process can be short sighted and can ignore important potential contributions lying among the other individuals involved in the process.

Collaborative computing environments account for the actual nature of a coordinated set of collaborative tasks conducted by people, such as an activity. An activity, unlike a typical project or traditional workflow, refers to objects, actions, and persons in the real world, and provides a computerized representation of selected aspects of those objects, actions, and persons within a collaborative information structure. A collaborative information structure includes ordered relationships between objects, actions and persons, collectively collaborative information objects. An exemplary collaborative information structure includes an activity. Other examples include collaborative workflows, business processes, team rooms, discussion databases, and the like.

In this regard, a simple collaborative workflow might include an ordered set of tasks assigned to several collaborators. The tasks and collaborators in this case are to be viewed as collaborative information objects while the workflow is the collaborative information structure. Typically, a software application designed to create and manage collaborative information structures provides a user interface to display the collaborative information structures in various ways to show the objects, their relationships, and order dependencies. One example of such a software application is an activity manager. Yet, no existing system provides a display that is both complete and descriptive in a way that accommodates flexible human-generated annotations.

BRIEF SUMMARY OF THE INVENTION

Embodiments of the present invention address deficiencies of the art in respect to collaborative information object management and provide a novel and non-obvious method, system and computer program product for annotating collaborative information structures. In an embodiment of the invention, a method for annotating collaborative information structures can be provided. The method can include creating a collaborative information structure document (ISD) with each of an object section and an annotation section, adding a collaborative object in a collaborative computing environment to the object section of the collaborative ISD, adding an annotation for the collaborative ISD to the annotation section of the collaborative ISD, and storing the collaborative ISD for use as a collaborative object in the collaborative computing environment.

In one aspect of the embodiment, adding a collaborative object in a collaborative computing environment to the object section of the collaborative ISD, further can include adding a reference to a collaborative object in the collaborative computing environment to the object section of the collaborative ISD. In another aspect of the embodiment, adding an annotation for the collaborative ISD to the annotation section of the collaborative ISD, can include adding rich media content as an annotation for the collaborative ISD to the annotation section of the collaborative ISD. In yet another aspect of the embodiment, adding an annotation for the collaborative ISD to the annotation section of the collaborative ISD, further can include adding a reference to a collaborative object as an annotation for the collaborative ISD to the annotation section of the collaborative ISD.

In another embodiment of the invention, a collaborative computing data processing system can be provided. The system can include a collaborative computing environment including different collaborative objects. The system also can include collaborative ISD disposed in the collaborative computing environment as a collaborative object. The collaborative ISD can include an object section and a separate annotations section. The object section can encapsulate collaborative objects, while the annotations section can encapsulate annotations to the collaborative ISD. Finally, the system can include a collaborative ISD interface providing access to add objects to either of the object section and the annotations section of the collaborative ISD and annotations to the annotations section of the collaborative ISD.

Additional aspects of the invention will be set forth in part in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The aspects of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute part of this specification, illustrate embodiments of the invention and together with the description, serve to explain the principles of the invention. The embodiments illustrated herein are presently preferred, it being understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown, wherein:

FIG. **1** is a pictorial illustration of a process for annotating collaborative information structures;

FIG. **2** is a schematic illustration of a collaborative computing data processing system configured for annotating collaborative information structures; and,

FIG. **3** is a flow chart illustrating a process for annotating collaborative information structures.

DETAILED DESCRIPTION OF THE INVENTION

Embodiments of the present invention provide a method, system and computer program product for annotating collaborative information structures. In accordance with an embodiment of the present invention, a collaborative ISD can be provided for use as a collaborative object in a collaborative computing environment. The collaborative ISD can encapsulate both collaborative objects for the collaborative computing environment, and also annotations with contextual content relating to the collaborative objects. In this regard, the annotations can include both textual content and other rich media content including references to other collaborative objects. In this way, a collaborative object or set of objects in the collaborative computing system can grow in meaning over time as annotations are added to an encapsulating collaborative ISD to provide greater context for the collaborative ISD.

In further illustration, FIG. **1** is a pictorial illustration of a process for annotating collaborative information structures. As shown in FIG. **1**, a collaborative computing environment **120** can be provided. The collaborative computing environment **120** can include a user interface through which collaborators can specify activities with collaborative objects **140** such as tasks, shared documents and messages for interaction with other collaborators specified by name or by role. The collaborative computing environment **120** further can include a collaborative ISD **110**. The collaborative ISD **110** can include both an objects section and an annotations section. The objects section can encapsulate collaborative objects **140** for a collaborative information structure such as an activity. The annotations section, by comparison, can encapsulate annotations **150** providing context for the collaborative information structure.

Collaborative objects **140** can be added to the collaborative ISD **110** directly to the objects section of the collaborative ISD **110** through the user interface provided by the collaborative computing environment, or through an ISD interface **130**. The ISD interface **130**, however, can permit the addition of annotations **150** to the annotation section of the collaborative ISD **110**. The ISD interface **130** also can permit the addition of objects **140** either to the annotation section of the collaborative ISD **110** (as an annotation) or to the objects section of the collaborative ISD **110**. In all cases, the objects **140** and annotations **150** also can include references to other objects **140** in the collaborative computing environment **120**. In any event, the entirety of the collaborative ISD **110** can be manipulated within the collaborative computing environment **120** as any other collaborative object **140**, while enjoying added context provided by the annotations section of the collaborative ISD **110**.

In this regard, objects **140** created from outside of the collaborative ISD **110** are automatically added to the objects section of the collaborative ISD **110** corresponding to the particular information structure within the collaborative computing environment **120**. Thus, the objects **140** of the information structure can be completely represented within the collaborative ISD **110** and the two can remain in sync. In one aspect of the embodiment, a given one of the object **140** can exist in either the objects section or the annotation section of the collaborative ISD **110**. However, in another embodiment, a given one of the objects **140** can exist in both.

In operation, an end user can move objects **140** from the object section of the collaborative ISD **110** to the annotation section of the collaborative ISD **110** for additional annotation. Yet, at any time an end user can move the objects **140** from the annotation section of the collaborative ISD **110** back to the objects section of the collaborative ISD **110**. Notably, objects **140** removed from the annotation section of the collaborative ISD **110** can be automatically moved to the objects section of the collaborative ISD **110** and are not deleted from the collaborative computing environment **120**. However, objects **140** "deleted" from either section of the collaborative ISD **110** are deleted from the information structure and objects **140** deleted from the information structure are deleted from the collaborative ISD **110**. Optionally, objects **140** deleted from either section of the collaborative ISD **110** can be replaced by a marker documenting the previous existence of the objects **140**, along with simple information regarding the deleted objects **140**, for instance a complete log of all actions relating to the objects **140**. As yet a further option, objects **140** and/or their respective annotations can be archived and recovered from within the collaborative ISD **110**.

The collaborative ISD **110** of FIG. **1** can be managed within a collaborative computing data process system. In this regard, FIG. **2** is a schematic illustration of a collaborative computing data processing system configured for annotating collaborative information structures. The system can include a host server **210** configured for communicative coupling to multiple different computing devices **220** over computer communications network **230**. The host server **210** can support the operation of a collaborative computing environment **260** forming a collaborative computing system with collaborative computing clients **240** in each of the different computing devices **220** over the computer communications network **230**.

ISD management logic **300** can be coupled to the collaborative computing environment **260** through the host server **210** and can include program code enabled to create and manage collaborative ISD documents **250**. Each of the collaborative ISD documents **250** can include an object section and an annotation section, the object section encapsulating collaborative objects in the collaborative computing environment **260** and the annotations section encapsulating annotations and objects acting as annotations to the objects in the object section. The collaborative ISD documents **250**, however, can be manipulated within the collaborative computing environment **260** as any other collaborative information structure such as an activity or workflow.

In further illustration, FIG. **3** is a flow chart illustrating a process for annotating collaborative information structures. The process can begin in block **310** with the creation of a collaborative ISD document. In block **320**, one or more collaborative objects such as tasks or collaborators can be selected and in block **330**, the collaborative objects can be added to an object section of the collaborative ISD document. Similarly, in block **340** one or more annotations can be created for the collaborative ISD document and the annotations can be inserted into an annotations section of the collaborative ISD document in block **350**. Finally, in block **360** the collaborative ISD can be stored for manipulation in the collaborative computing environment.

It is to be recognized by the skilled artisan that the order implied by blocks **320** through **350** are not requisite to the annotation of collaborative information structures. Rather, annotations also can be added to the collaborative ISD before the collaborative objects to which the annotations refer. Consequently, collaborative objects can be created from within a collaborative ISD to permit a fluid annotation process. For example, the user provide an annotation first, such as, "Initial project tasks include:" and second the user can create the actual objects (the project tasks) which can be linked to the annotation by reference or displayed in-line. Having created

the actual objects and not just placeholders, the user has accomplished work in context in a natural flow. Thus, the act of creating the objects from within the ISD then causes those objects to exist in the collaborative computing environment.

Embodiments of the invention can take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment containing both hardware and software elements. In a preferred embodiment, the invention is implemented in software, which includes but is not limited to firmware, resident software, microcode, and the like. Furthermore, the invention can take the form of a computer program product accessible from a computer-usable or computer-readable medium providing program code for use by or in connection with a computer or any instruction execution system.

For the purposes of this description, a computer-usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The medium can be an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system (or apparatus or device) or a propagation medium. Examples of a computer-readable medium include a semiconductor or solid state memory, magnetic tape, a removable computer diskette, a random access memory (RAM), a read-only memory (ROM), a rigid magnetic disk and an optical disk. Current examples of optical disks include compact disk-read only memory (CD-ROM), compact disk-read/write (CD-R/W) and DVD.

A data processing system suitable for storing and/or executing program code will include at least one processor coupled directly or indirectly to memory elements through a system bus. The memory elements can include local memory employed during actual execution of the program code, bulk storage, and cache memories which provide temporary storage of at least some program code in order to reduce the number of times code must be retrieved from bulk storage during execution. Input/output or I/O devices (including but not limited to keyboards, displays, pointing devices, etc.) can be coupled to the system either directly or through intervening I/O controllers. Network adapters may also be coupled to the system to enable the data processing system to become coupled to other data processing systems or remote printers or storage devices through intervening private or public networks. Modems, cable modem and Ethernet cards are just a few of the currently available types of network adapters.

We claim:

1. A collaborative computing data processing system comprising:

a collaborative computing environment executing in a memory of a server formed between different collaborative computing clients, the collaborative computing environment comprising a plurality of collaborative objects;

a collaborative information structure document (ISD) stored in the server as a collaborative object, the collaborative ISD comprising an object section and a separate annotations section, the object section encapsulating collaborative objects and also references to the collaborative objects in the collaborative computing environment, the annotations section encapsulating annotations to the collaborative ISD; and,

a collaborative ISD interface executing in the memory of the server, the collaborative ISD interface providing access to add objects to at least one of the object section of the collaborative ISD and the annotations section of the collaborative ISD and also providing access to add annotations to the annotations section of the collaborative ISD, where an object added to the annotation section of the collaborative ISD is added as an annotation of the object.

2. The system of claim **1**, wherein the annotations section further encapsulates references to collaborative objects in the collaborative computing environment.

3. The system of claim **1**, wherein the annotations comprise rich media.

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